

## WHAT IS CLAIMED IS:

- 1    1. A lane deviation alarm system, comprising:
  - 2        a lane defining line detecting section that detects
  - 3        a lane defining line of a lane traveled by a host
  - 4        vehicle; and
  - 5        a criteria changing section that changes a criteria
  - 6        for determining a lane deviation tendency of the host
  - 7        vehicle, on the basis of a detecting condition of the
  - 8        lane defining line.
- 1    2. The lane deviation alarm system as claimed in claim
- 2    1, further comprising:
  - 3        a yaw angle detecting section that detects a yaw
  - 4        angle of the host vehicle on the basis of the detected
  - 5        lane defining lines;
  - 6        a forward-observed-point calculating section that
  - 7        calculates a forward observed point by multiplying a
  - 8        vehicle speed of the host vehicle and an anticipated
  - 9        deviation time;
  - 10      a forward-observed-point lateral-displacement
  - 11      calculating section that calculates a lateral
  - 12      displacement at the forward-observed-point, on the basis
  - 13      of the yaw angle and the forward-observed-point;
  - 14      a lane deviation tendency determining section that
  - 15      determines whether the host vehicle is in a lane
  - 16      deviation tendency, on the basis of the
  - 17      forward-observed-point lateral-displacement; and
  - 18      a lane deviation tendency informing section that
  - 19      informs a driver that the host vehicle is in the lane
  - 20      deviation tendency, on the basis of the determination
  - 21      result at the lane deviation tendency determining section,

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22       wherein the criteria changing section changes an  
23   anticipated deviation time so as to decrease the  
24   influence of the yaw angle on the calculation of the  
25   forward-observed-point lateral-displacement when the lane  
26   defining line detecting section detects only one of both  
27   lane defining lines.

1   3.   The lane deviation alarm system as claimed in claim  
2   1, wherein the criteria changing section changes the  
3   criteria of the lane deviation tendency on the basis of  
4   the lane defining line, so that a decision of the lane  
5   deviation tendency is suppressed as the non-detection  
6   frequency of the lane defining line increases.

1   4.   The lane deviation alarm system as claimed in claim  
2   1, wherein the criteria changing section increases a  
3   change quantity of an anticipated deviation time as the  
4   non-detection frequency of the lane defining line  
5   increases.

1   5.   The lane deviation alarm system as claimed in claim  
2   2, wherein the lane deviation tendency determining  
3   section determines the lane deviation tendency by  
4   comparing the forward-observed-point lateral-displacement  
5   and each threshold of each lane defining line, and  
6   further comprising a threshold changing means that  
7   changes the threshold when a state that the lane defining  
8   line detecting section detects one of both lane defining  
9   lines continues for a first predetermined time.

1   6.   The lane deviation alarm system as claimed in claim  
2   5, wherein the threshold changing section increases the

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3 change quantity of the threshold as the non-detection  
4 frequency of the one lane defining line increases.

1 7. The lane deviation alarm system as claimed in claim  
2 5, further comprising a lane defining line anticipating  
3 model which corrects a location of a lane defining line  
4 detected with a high detection frequency and a location  
5 of the other lane defining line detected with a low  
6 detection frequency, using a detection result of the lane  
7 defining line detected with the high detection frequency,  
8 wherein the correction result of the lane defining  
9 line locations using the lane defining line anticipation  
10 model affects the forward-observed-point  
11 lateral-displacement to generate an error,  
12 wherein the threshold changing section determines  
13 the threshold taking account of the  
14 forward-observed-point lateral-displacement including the  
15 error due to the correction result.

1 8. The lane deviation alarm system as claimed in claim  
2 1, wherein the lane defining line detecting section  
3 includes a camera system which takes an image indicative  
4 of the lane defining lines of a traveling lane and which  
5 is capable of varying a setting of an image picking-up  
6 condition according to the image picking-up environment,  
7 and the criteria changing section changes the criteria  
8 when the setting of the image picking-up condition is  
9 changed.

1 9. The lane deviation alarm system as claimed in claim  
2 5, wherein the lane deviation tendency determining  
3 section stops the determination of the lane deviation

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4 tendency based on the undetected lane defining line when  
5 a state that the lane defining line detecting section  
6 detects one of both lane defining lines continues for a  
7 second predetermined time.

1 10. The lane deviation alarm system as claimed in claim  
2 1, wherein the criteria changing section decreases an  
3 anticipated deviation time as the non-detection frequency  
4 of the lane defining line increases.

1 11. The lane deviation alarm system as claimed in claim  
2 5, wherein the threshold changing section increases the  
3 threshold when a state that the lane defining line  
4 detecting section detects one of both lane defining lines  
5 continues for the first predetermined time.

1 12. A lane deviation alarm system, comprising:  
2       a controller arranged  
3       to detect a lane defining line of a lane traveled by  
4 a host vehicle,  
5       to change a decision criteria for determining a lane  
6 deviation tendency of the host vehicle, on the basis of a  
7 detecting condition of the lane defining line, and  
8       to generate an alarm when the lane deviation  
9 tendency is determined by comparing a relationship  
10 between the host vehicle and the lane defining line with  
11 the criteria.

1 13. A method of generating an alarm when a lane  
2 deviation tendency of a host vehicle is determined, the  
3 method comprising:

4           detecting a lane defining line of a lane traveled by  
5    a host vehicle; and

6           changing a criteria for determining a lane deviation  
7    tendency of the host vehicle, on the basis of a detecting  
8    condition of the lane defining line.

1    14. A lane deviation alarm system, comprising:

2       lane defining line detecting means for detecting a  
3    lane defining line of a lane traveled by a host vehicle;  
4    and

5       criteria changing means for changes a criteria for  
6    determining a lane deviation tendency of the host vehicle,  
7    on the basis of a detecting condition of the lane  
8    defining line.